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ABSTRACT

The changing status of female faculty at doctorate-granting universities during 1971-1980 is examined, along with patterns in the wide range of female representation across institutions. The data were drawn from the Higher Education General Information Survey. The percentage of women at all ranks increased 4.1 percent during the decade, from 14.7 percent to 18.8 percent. Most of the change occurred at the lower ranks; almost no change occurred at the full professor rank. However, at many universities, the number and percentage of female faculty oscillate up and down over the decade, suggesting that any increase is more likely the result of a random event than a vigorous affirmative action program. Fifteen of the 183 universities had fewer women faculty in 1980 than they did in 1971. Twenty-six report about the same or a lower percentage of women. An increase in availability of female doctorates during the period did not translate into automatic increments in female representation on all campuses. The relationship between the percentage of female faculty and institutional characteristics, such as student body size, geographic location, and curriculum emphasis, are examined for clues to the wide variation in current percentage of female faculty. (SW)

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A Ten-Year Progress Report on Women Faculty at Doctorate-Granting Universities

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Introduction

Status reports are one way to measure whether federal policies have had their intended effect. During the 1970s, affirmative action policies proved to be highly controversial in higher education. Researchers and advocates monitoring the number and proportion of women on college faculties have documented small increases but many continuing inequities (Ahern & Scott, 1981; Astin & Snyder, 1982; Gappa & Uehling, 1979; Levine, 1979; National Center for Education Statistics, 1981; Waldenberg, 1981). While these reports are quite consistent in their portrayal of modest progress in higher education employment, they provide little detail on a particular sector or on the range of performance among similar institutions.

This paper has two major purposes. The first is to focus specifically on doctorate-granting universities, the sector where women are least well represented, and to examine the changing status of women faculty between 1971 and 1980. Doctorate-granting universities have a vested interest in complying with Executive Order 11246 which required affirmative action plans, goals and timetables beginning in 1972 because most, if not all, receive government contracts. The ten-year timeframe for the study allows a preliminary and partial assessment of how effective federal policy has been in increasing the representation of women at these universities.

The second purpose is to explore the extent and causes of variation in the status of women. Is the proportion of women faculty related to size of the institution? geographic location? or curriculum emphasis? Have all institutions managed to benefit from the growing pool of female doctorates? How systematic have the increases been for individual institutions? These and other issues are explored in a discussion of institutional variation.

Population and Data Base

Universities included in this study were the 183 public and private institutions classified as doctorate-granting universities by the Carnegie Council (1976). Data on full-time instructional faculty, degrees earned, and institutional characteristics were drawn from the Higher Education General Information Surveys (HEGIS) conducted by the National Center for Education Statistics for the years 1971-72 through 1980-81. The HEGIS data base offers two advantages: it is national and comprehensive in scope, providing information on all institutions in the population, and it includes institutional identification so that progress at any one university can be tracked over the decade. Given the focus of the study, the data base also has limitations, particularly the lack of discipline identification and racial background of faculty members.

Although doctorate-granting universities share certain general characteristics related to the presence of doctoral programs and faculty research endeavors, they vary widely on many dimensions. Of the 183 institutions, 64 are private and 119 are public. Only one, Texas Woman's University, is a women's college. Howard University is the only historically black institution. Rockefeller University has less than 100 students and the University of Minnesota at Minneapolis-St. Paul has more than 63,700 students. The mean enrollment for these institutions is 17,000 students.

The Changing Status of Women Faculty

How much progress has been made by these institutions in hiring and promoting women during the 1970s? The picture that emerges from Table 1 is one of small annual increases in the proportion of women on the faculties of doctorate-granting universities. The overall percentage increased from 14.7 percent in 1971-72 to 18.8 percent in 1980-81, a four percent gain over the ten-year period.

TABLE 1

Proportion of Women Faculty at Doctorate-Granting Universities, 1971-72 - 1980-81

Year	Total Faculty	Full	Assoc	Asst	Inst	Lect
1971-72	14.7%	5.6%	11.3%	17.3%	38.9%	27.5%
1972-73	15.6	5.8	11.5	19.0	42.3	30.6
1973-74	No survey conducted					
1974-75	16.6	6.0	12.3	22.9	47.1	34.3
1975-76	16.9	5.7	12.7	24.7	47.4	37.3
1976-77	17.5	5.8	13.2	26.3	49.6	38.9
1977-78	17.8	5.8	13.8	27.8	50.7	40.8
1978-79	18.1	5.9	14.6	28.7	51.9	40.7
1979-80	18.4	6.0	15.5	29.5	53.1	42.3
1980-81	18.8	6.2	16.5	30.3	52.6	44.2

Source: HEGIS Employee Surveys, 1971-72 - 1980-81, National Center for Education Statistics

Considering only ladder-rank or tenure-track positions (assistant, associate, or full professor), the percentage increased from 11.4 percent to 16.1 percent - a 4.7 percent gain. However, growth in the representation of women across these three ranks was not uniform. While the percentage of women assistant professors increased 13 percent, the percentage of women at the associate rank grew 5.2 percent and almost no change occurred among full professors (+.6 percent).

The 1970s produced some dramatic shifts in the distribution of faculty by rank and these changes have had important consequences for the status of women faculty. In particular, large cohorts of male faculty hired during the 1960s moved upward in the ranks expanding the number of full and associate professors on each campus. Although these institutions experienced some growth in total faculty size, the substantial expansion of the senior ranks was largely accomplished by a reduction in the number of assistant, instructor, lecturer, and no rank faculty.

Table two illustrates how this trend affected individual campuses. The mean number of men and women faculty by rank are displayed for an average size doctorate-granting university with 17,000 students. On this hypothetical campus, there were 71 more full professors in 1980 than in 1971, more than a 37 percent growth rate for the rank. Yet the number of women at the rank only increased by six, a little better than one promotion every two years. By contrast, there was a 9 percent reduction in the number of assistant professors slots but the percentage of women increased from 17 to 30 percent and the absolute number rose from 37 to 58. The number of women employed in non-tenure-track positions decreased slightly over the decade but women accounted for an ever increasing share of that diminishing total.

TABLE 2

MEAN NUMBER MEN AND WOMEN FACULTY BY RANK AT THE AVERAGE DOCTORATE-GRANTING UNIVERSITY, SELECTED YEARS

	1971-72			1980-81			
	Men	Women	Total	Men	Women	Total	Percent Change
Tenure Track							
Full	196	12	208	267	18	285	(+37%)
Associate	150	19	169	175	35	210	(+24%)
Assistant	174	37	211	134	58	192	(- 9%)
Non-Tenure Track (Instructor, Lecturer, no rank)	54	32	86	20	29	59	(-31%)
Total	574	100	674	606	140	746	(+10.1%)

Source: Employee Survey, HEGIS, National Center for Education Statistics

The shift of male faculty upward in the ranks and the entry of women into lower and/or untenured positions has done little to alleviate the effects of past underrepresentation. Data for the most recent year 1980-81 are displayed in Figure 1. They illustrate the nature and extent of inequities still remaining in the distribution of men and women by rank.

Given this distribution by rank, it is no surprise that there is a substantial difference in tenure rates. In 1980-81, 70 percent of the men but only 41 percent of the women had tenure.

The gap in mean salaries for men and women apparent early in the decade remains at every rank in 1980-81. The gap in mean salaries for assistant professors on 9-month contracts was $1300, or 7% higher for men in 1980-81. This dollar gap is wider than it was in any previous year. Female full professors averaged $4667 less than their male counterparts in 1980.

Thus, the most striking pattern that emerges for these institutions is the significant expansion of the senior ranks and the corresponding reduction in the number of assistant professors and full-time instructors and lecturers. The four percent gain in the overall proportion of women during the 1970s was largely accomplished by increasing women's share of the shrinking pool of junior faculty. While the current 30 percent of women at the assistant professor rank comes closer to the percentage of women earning doctoral degrees than ever before, the lack of progress in the senior ranks is cause for concern. The small number (18 at the average university) and proportion (6.2 percent) of women at the full professor rank suggest that decision-making traditionally reserved for senior faculty--including decisions about who will be tenured and promoted among junior faculty--is done with little or no female participation.

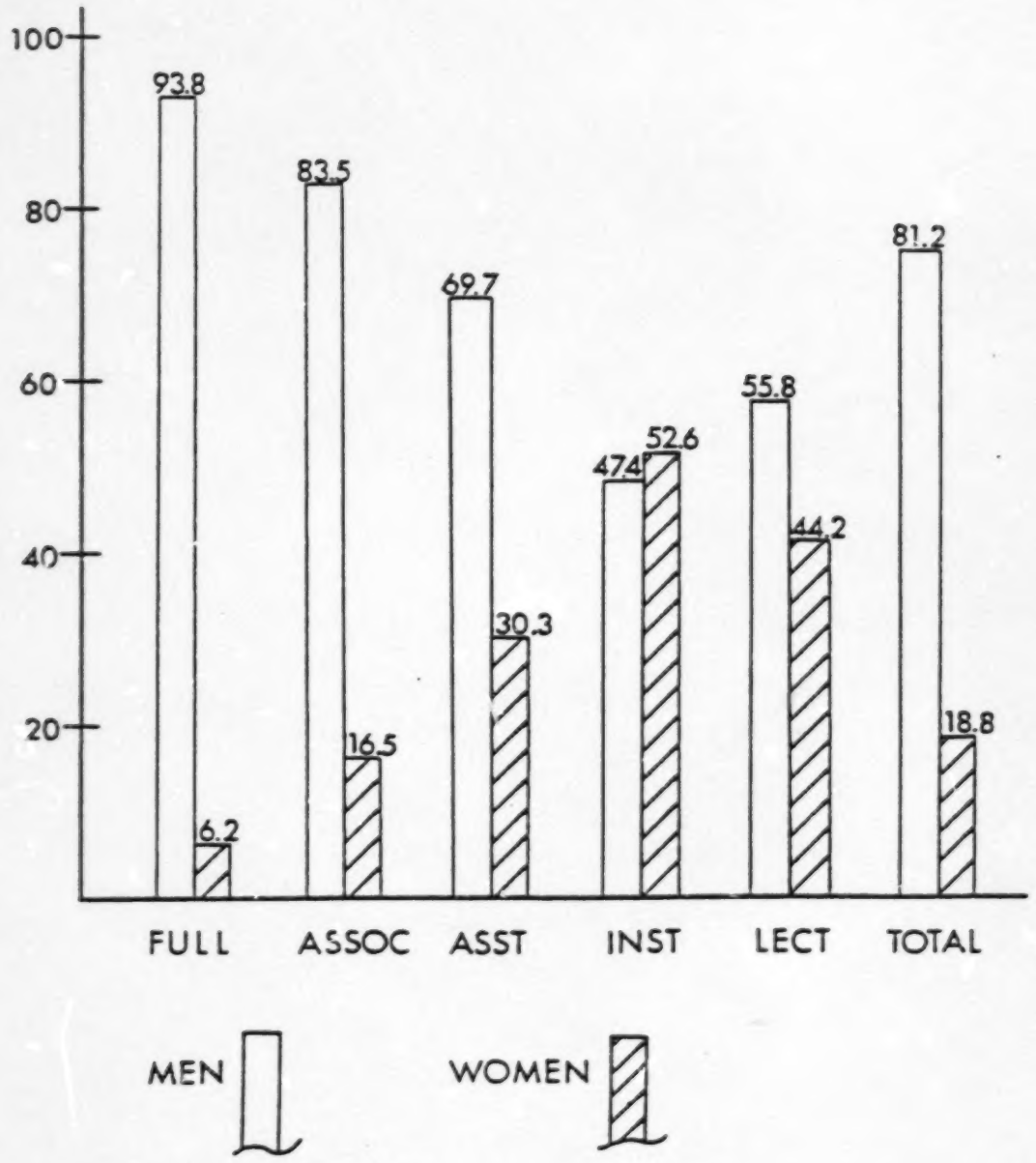

Figure 1. Percent Men and Women Within Rank on Doctorate-Granting University Faculties, 1980-81

The findings reported here for all doctorate-granting universities hide substantial variation however. The following section focuses on differences among the institutions, in particular, those characteristics that seem to differentiate universities with high and low proportions of women faculty.

Institutional Differences in the Status of Women Faculty

Size, location, research-orientation, curriculum emphasis, and type of control are all considered important dimensions of institutional variation. These characteristics are examined as potential clues for identifying institutional environments associated with greater equity for women.

Before examining these characteristics in detail, it may be helpful to list the twenty doctorate-granting institutions which have the highest and lowest percentages of women on their full-time instructional faculty. These institutions are listed in Tables 3 and 4.

Texas Woman's University is the only women's college in this population and the very large proportion of women on its faculty (68%) and among its full professors (41%) reaffirms the importance of women's colleges in providing opportunities for achievement of women faculty.

California Institute of Technology is the only institution in the group which has no women on its full-time faculty, though it is joined by Claremont Graduate School, University of Missouri-Rolla, and Rockefeller University in having no women at the full professor rank.

To determine if the current proportion of women faculty was related to certain institutional characteristics, a series of simple regressions and one-way anovas were performed. The proportion of women students, curriculum emphasis, Carnegie classification, size of the student body, control, land-grant status, region of the country, and size of the city in which the university is located were used as independent variables. Variable names

TABLE 3

20 Institutions with the Highest Percentage of Women Faculty, 1980-81

University	% Women on F-T Faculty	% Degrees Awarded in Sci/Tech Fields*	% Degrees Awarded in Non-Sci Fields**
Texas Woman's Univ	68.1	1.8	89.4
Adelphi University	39.4	5.6	42.3
Loma Linda Univ	38.0	9.7	74.0
Univ of NC, Greensboro	35.8	5.6	47.4
St. Louis Univ, Main	33.9	11.3	38.6
Catholic University	33.1	9.9	31.4
Howard University	32.4	18.1	43.0
U of So. Mississippi	30.8	11.1	49.2
U S International Univ	30.0	.4	26.0
U of No. Colorado	29.7	3.4	54.9
Ball State University	29.3	7.8	45.0
Baylor University	28.9	10.5	30.7
Loyola U of Chicago	28.4	13.8	22.4
Virginia Commonwealth U	28.2	9.0	37.3
Wayne State University	27.6	13.8	42.8
New Sch for Soc Res	27.6	0	9.8
Cornell U Statutory C	26.0	48.8	20.3
Ill State University	25.8	13.8	37.8

*(Sum of all degrees awarded in 1980-81 in Mathematics, Agriculture, Biological & Physical Sciences, Computer Sciences, & Engineering)/Total degrees awarded

**(Sum of all degrees awarded in 1980-81 in Education, Foreign Languages, Health Professions, Home Economics, and Library Science)/Total degrees awarded

Source: 1980-81 Employee Survey and Degrees Earned Survey, HEGIS, National Center for Education Statistics

TABLE 4

20 Institutions with the Lowest Percentage of Women Faculty, 1980-81

University	% Women on F-T Faculty	% Degrees Awarded in Sci/Tech Fields*	% Degrees Awarded in Non-Sci Fields**
Calif Inst of Tech	0.0	98.9	0
Claremont Graduate Sch	1.7	5.8	22.9
Rensselaer Poly Inst	4.4	75.8	.1
U of Missouri, Rolla	4.7	96.5	0
Georgia Inst of Tech	5.7	72.6	2.0
Polytechnic Inst of NY	7.1	99.4	0
Univ of Notre Dame	7.5	23.6	.8
Lehigh University	7.7	45.0	10.7
Texas A & M, Main Campus	9.0	51.1	16.1
Ill. Inst of Technology	9.2	61.0	0
Mass Inst of Technology	9.8	78.2	0
Harvard Univerity	10.7	15.7	19.1
U of Illinois, Urbana	11.0	38.7	18.1
Univ of Chicago	11.4	17.3	5.7
Stanford University	11.6	46.4	9.2
Princeton University	11.6	36.2	2.4
Colorado State Univ	11.8	40.4	22.1
U of Colorado, Boulder	11.9	25.8	15.4
Rockefeller University	12.1	95.0	0

*(Sum of all degrees awarded in 1980-81 in Mathematics, Agriculture, Biological & Physical Sciences, Computer Sciences, & Engineering)/Total degrees awarded

**(Sum of all degrees awarded in 1980-81 in Education, Foreign Languages, Health Professions, Home Economics, and Library Science)/Total degrees awarded

Source: 1980-81 Employee Survey and Degrees Earned Survey, HEGIS, National Center for Education Statistics

and definitions are included in Appendix A and an inter-correlation matrix can be found in Appendix B. Of the eight variables tested, only three were significantly related to the percentage of women on the faculty. These were the proportion of women students, curriculum emphasis, and Carnegie classification.

The proportion of women on the faculty is highly correlated with the proportion of women in the student body. Although female enrollment patterns changed dramatically during the last decade, these changes have not reduced the strong link between the representation of women in the student body and on the faculty. For doctorate-granting universities, more women students meant more women on the faculty as a whole and at the rank of full professor. One explanation offered by Gordon and Kerr (1978) is that women are more likely to be recommended for appointment when there are substantial numbers of women students in classes.

A second, complementary explanation involves the curriculum emphasis of universities with high and low proportions of women among their students and on their teaching faculties. The higher the percentage of degrees awarded in scientific and technical fields, the lower the percentage of women faculty and students. The relationship between curriculum emphasis and representation of women on the faculty is visible in Tables 3 and 4 where the percentage of degrees awarded in Agriculture, Engineering, Biological and Physical Sciences, Computer Science, and Mathematics is reported for the top and bottom 20 institutions. Ten of the 20 institutions with the lowest percentages of women faculty awarded 50% or more of their degrees in these scientific and technical fields. Correspondingly, institutions with a high percentage of women faculty are characterized by large programs in education, home economics, library science, foreign languages, and health professions.

A significant difference was also found among institutions grouped by Carnegie classification. The variable "Carnegie classification" represents the four subcategories of "Doctorate-Granting Institutions" identified by the Council (1976). These subcategories reflect differing levels of research orientation and have also been used as an indicator of prestige (Gordon & Kerr, 1978).

> Research Universities I: The 50 leading universities in terms of federal financial support of academic science provided they awarded at least 50 Ph.D.s
>
> Research Universities II: Universities from the top 100 recipients of federal financial support which awarded at least 50 Ph.D.s
>
> Doctorate-Granting Universities I: Institutions awarding 40 or more Ph.D.s in at least five fields or which received at least $3 million in total federal support
>
> Doctorate-Granting Universities II: Institutions awarding at least 20 Ph.D.s without regard to field (Carnegie, 1976, p. xv)

An analysis of variance procedure was performed to test for significant differences among the mean proportions of women at the four types of institutions for 1980. Doctorate-Granting II universities had a significantly higher proportion of women on the faculty than universities in the other three subclassifications. This was also true for the individual ranks of assistant and full professor. Table 5 gives the mean percentage of women by Carnegie classification for 1980.

Size of student body, control, region of the country, landgrant status, and size of the city where the university is located were not significantly related to the proportion of women on the faculty.

Thus, fewer women in the student body, a scientific and technical curriculum emphasis, and a strong research orientation and high prestige continue to be associated with low percentages of women on the faculty.

TABLE 5

Women as Percentage of Full-Time Faculty in Universities, by Carnegie Classification, 1980-81

Carnegie Classification	Percent Women on Faculty 1980-81
All Doctorate-Granting Universities	18.8
1.1 Research Universities I	16.6
1.2 Research Universities II	18.7
1.3 Doctorate-Granting Univ I	19.4
1.4 Doctorate-Granting Univ II	24.6

Source: Employee Survey, 1980, HEGIS, National Center for Education Statistics and Carnegie Council, 1976.

Discussion

A status report such as this brings few surprises to those who have tracked the progress of women faculty in higher education as a whole. For instance, the pattern of no significant increase in the percentage of female full professors over the ten year period is a familiar finding, although the figure for all institutions combined is about 10 percent rather than the six percent we see here among doctorate-granting universities. The principal value of such a report then lies in the detail it provides about a certain class of institutions. This is particularly true since institutions tend to compare themselves on any number of issues with a limited group of peer institutions and to reject comparisons with higher education as a whole. While the selection of peer institutions is individually tailored and changes with the issue, this report has reduced the universe from 3,000 postsecondary institutions to the 183 universities which share some concern for graduate education, research, and hiring of doctorate-level faculty. However, even within this classification the differences among institutions are often more compelling than their similarities. Differences in size and curriculum emphasis are particularly great but so too are the conditions for women faculty and students.

If Rosabeth Moss Kanter's (1977, Ch. 8) observation is true that it seems to take a sufficient number of outgroup members in an organization before they are viewed as individuals rather than tokens, then many campuses are far from being able to provide the kind of environment where women faculty and students are likely to thrive. The problem is most accute for women faculty at universities with a concentrated focus on science and engineering. University of Missouri-Rolla, Polytechnic Institute of Brooklyn, and Rensselaer University each reported having 15 or less full-time female faculty in 1980. Lehigh, Georgia Tech, and Illinois Institute of Technology have just a few

more than that. While the numbers increased at all six of these universities over the ten-year period, progress is excruciatingly slow. Low availability of women doctorates in scientific and technical fields is of course part of the explanation for the small numbers.

However, the extent of variation among even this small group of scientific and engineering-oriented institutions raises intriguing questions about institutional climate and conditions for women. Why, for instance, has California Institute of Technology found it impossible to hire and retain women faculty from the mid-70s on? In 1974-75, they reported five full-time faculty women; they have since disappeared. Contrast this with the record of Massachusetts Institute of Technology where the number and percentage of women has been climbing steadily over the decade. What explains the difference? Not the institutional characteristics we have tested in this study.

In certain cases, institutional history plays an important role in explaining variation in the percentage of female faculty. Among the lowest 20 institutions, several were predominantly or exclusively male institutions which have recently dropped restrictive admissions policies for women students. Similarly, several universities with the highest percentage of women faculty were women's colleges at one time. University of North Carolina, Greensborough, is such a case.

Reviewing institutional records on a year-by-year basis provides yet another view of progress for women faculty. The impression of slow but systematic increases described for the group as a whole is a pattern found at only a limited number of institutions. At many universities, the number and percentage of female faculty oscillate up and down over the decade suggesting that any increase is more likely the result of a random event than a vigorous affirmative action program.

If progress has been halting and uncertain on some campuses, it has been nonexistent on others. Fifteen universities have fewer women faculty in 1980 than they did earlier in the decade. SUNY-Albany, University of Illinois-Chicago Circle, Hofstra, Ohio State, University of Hawaii, Boston College and the University of Minnesota, along with others, have experienced a reduction in numbers. Twenty-six universities are reporting about the same or a lower percentage of women on the faculty. Thus, the substantial increase in availability of female doctorates during the period did not translate into automatic increments in female representation on every campus. On the contrary, women have lost ground at a number of universities. Not surprisingly, a few of the biggest losses occurred on campuses where the total faculty size was scaled down over the decade.

On the positive end of the spectrum, a few universities have made significant gains in the representation of women on the faculty. Dartmouth College has the most impressive record: it increased the percentage of female faculty from 4.8 percent in 1971-72 to 20.3 percent in 1980-81.

Thus in describing the status of women faculty at doctorate-granting universities during the 1970s, any generalization must be tempered by the awareness of wide variation among the campuses. While many of the gross disparities are associated with institutional characteristics such as the proportion of women students, curriculum emphasis, and research orientation, perplexing differences remain. A closer examination of individual institutional records suggests that other factors--such as institutional history, commitment to affirmative action programs, and leadership--must play a significant role in the extent to which progress has been made in increasing the representation of women. In this regard, the number of universities with erratic records and/or actual losses suggest there is an urgent need for

sustained attention to the issues of hiring and retaining women faculty on many campuses and that progress for the whole will continue to be relatively meager unless that is accomplished.

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Appendix A

VARIABLE DEFINITIONS

Abbreviated Variable Name	Variable Name	Variable Definition & Coding Information
pro_f	Proportion women, 1980	Proportion of total 1980 faculty which is female; includes all ranks
scitech	Proportion scientific/technical degrees awarded	(Sum of degrees awarded at all levels in agriculture, engineering, biological & physical sciences, computer science, & math in 1980)/Total degrees awarded, 1980
enroll	Student enrollment, 1980	Student enrollment, Fall 1980
profstu	Proportion women students	Proportion of women students, 1979
control	Control	Combination pub/priv (0); public ; private (2)
carnegie	Carnegie classification	Four subclassifications of Doctorate-Granting Universities: Research I (1); Research II (2); Doctorate-Granting I (3); Doctorate-Granting II (4)
obereg	Region of the country	Regions as determined by Dept of Commerce: (1) New Eng: CT ME MA NH RI VT (2) Mid East: DE DC MD NJ NY PA (3) Great Lakes: IL IN MI OH WI (4) Plains: IA KS MN MO NE ND SD (5) Southeast: AL AR FL GA KY LA MS NC SC TN VA WV (6) Southwest: AZ NM OK TX (7) Rocky Mountains: CO ID MT UT WY (8) Far West: AK CA HI NV OR WA (9) Outlying areas: AO CZ GU PR TO VI (0) US Service Schools
citysize	Size of SMSA in which univ is located	(0) Not identified (1) outside any SMSA (2) anywhere w/in an SMSA of less than 250,000 (3) anywhere w/in an SMSA of 250,000-499,999 (4) anywhere w/in an SMSA of 500,000-999,999

Abbreviated Variable Name	Variable Name	Variable Definition & Coding Information
citysize (cont)		(5) in SMSA of 1,000,000-1,999,999 outside center city (6) in SMSA of 1,000,000-1,999,999 inside center city (7) in SMSA or SCSA of 2,000,000 or more outside center city (8) in SMSA or SCSA of 2,000,000 or more w/in center city
landgr	Landgrant status	Non-landgrant (0)/Landgrant (1)/Member NASULGC (2)

Appendix B

INTERCORRELATION MATRIX

	PRO_F	PROFSTU	SCITECH	EGROWTH	ENROLL	CONTROL	CITYSIZE	OBEREG	CARNEGIE	LANDGR
PRO_F	1.00									
PROFSTU	0.79	1.00								
SCITECH	-0.58	-0.76	1.00							
ENROLL	0.01	0.19	-0.17	0.03	1.00					
CONTROL	-0.04	-0.33	0.07	-0.05	-0.44	1.00				
CITYSIZE	0.12	-0.10	-0.03	-0.02	-0.02	0.60	1.00			
OBEREG	-0.06	0.03	-0.05	0.09	-0.03	-0.28	-0.22	1.00		
CARNEGIE	0.31	0.27	-0.23	0.06	-0.40	-0.09	-0.15	0.02	1.00	
LANDGR	-0.15	0.06	0.02	0.02	0.34	-0.68	-0.38	0.18	-0.10	1.00